Small Business Innovation Research/Small Business Tech Transfer

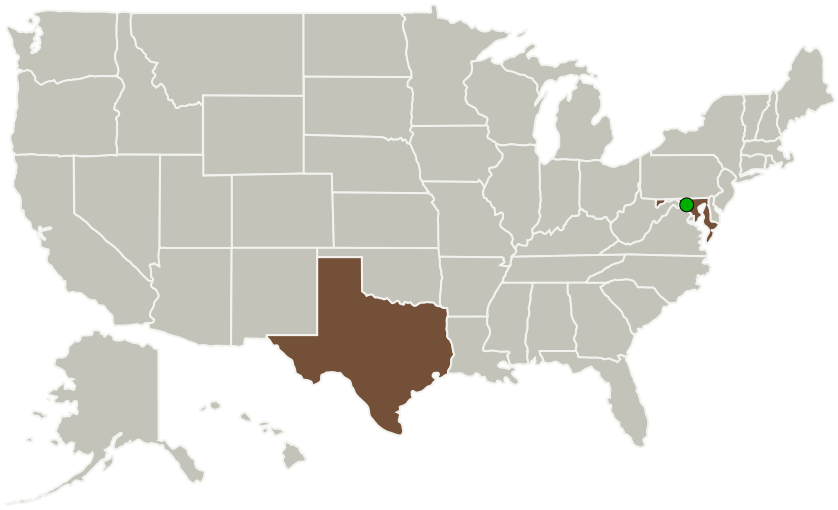
Advanced Exoplanet Star Tracker for Orbit Self Determination, Phase I

Completed Technology Project (2012 - 2012)

Project Introduction

This proposal puts forth an innovative star tracker hardware sensor that allows for autonomous calculation of a spacecraft's orbit by employing Doppler Spectroscopy and Astrometric techniques. The proposed advanced star tracker provides onboard deep space orbit self determination capabilities through the use of specialized reference stars that have exoplanet companions. The motion of exoplanets around a reference star's barycenter provides a stable, highly predictable natural signal pattern. An advanced exoplanet star tracker enhances mission capabilities for future manned and unmanned space vehicles as well as reducing Deep Space Network (DSN) tracking requirements and resources.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Keystone Aerospace	Lead Organization	Industry	Austin, Texas
Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

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Table of Contents

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Primary U.S. Work Locations	
Maryland	Texas

Project Transitions

February 2012: Project Start

August 2012: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/137958)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Keystone Aerospace

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

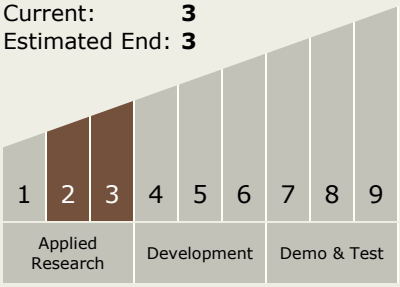
Carlos Torrez

Principal Investigator:

George Hindman

Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



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Technology Areas

Primary:

- TX17 Guidance, Navigation, and Control (GN&C)
  - TX17.2 Navigation Technologies
    - TX17.2.3 Navigation Sensors

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System